# A Framework for Developing a Rapid Assessment Protocol for Southern New England Seasonally Flooded Ponds to Assist Statewide Wetland Monitoring Programs

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## What Are Seasonally-Flooded Ponds?

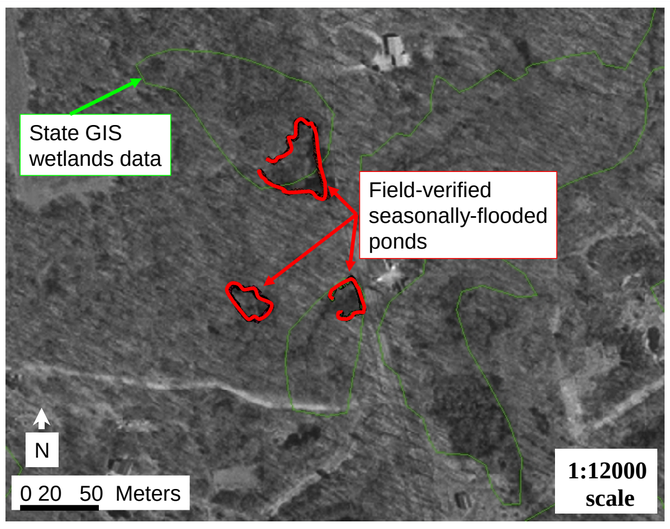
Seasonally-flooded ponds are isolated wetlands in New England that provide important hydrological, biological, and ecosystem functions. These wetlands, also known locally as vernal pools, are small bodies of standing fresh water that are most obvious in the landscape during the spring of the year. They are usually temporary in nature.

Seasonally-flooded ponds provide specialized breeding habitats for several amphibian and invertebrate species but are increasingly being impacted by urbanization and human disturbance. Protection of these specialized wetlands on state and tribal lands is becoming a priority, particularly in light of widespread concern over declines in amphibian populations.

## Why Do We Need Rapid Assessment Protocols for Seasonally-Flooded Ponds?

Rapid assessment protocols are needed to document the current status of seasonally flooded ponds and provide baseline information to help gauge the overall effectiveness of federal, state, and tribal protection and restoration actions. For example:

- Conserving pond-breeding amphibians may require ponds with a range of hydroperiods (Paton and Crouch 2002)
  - but we currently don't know what the distribution of pond hydroperiods is in New England
- Terrestrial buffer zones may be important for maintaining pond-breeding amphibian populations (Semlitsch 1998)
  - but we currently don't know the landscape setting of most New England ponds, particularly in developed areas

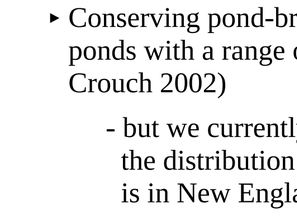



### Tier 1. Landscape-Scale Assessment

**Building a reference network of seasonally-flooded ponds along a disturbance gradient: GIS data and results of field surveys overlaid on a panchromatic aerial photograph**

Tier 1 is the largest scale of analysis; using aerial photography and a Geographic Information System (GIS) general profiles will be developed that depict the relative extent and distribution of seasonally-flooded ponds. Surrounding land cover and land use will also be identified. The management applications of Tier-1 landscape-scale analysis include inventory, trend assessment (historical and recent losses, encroachment), coarse stressor identification, and "screening-level" reporting of wetland condition per CWA Section 305b.

**We will follow a 3-tiered approach consisting of Tier 1 (landscape-scale assessment), Tier 2 (rapid assessment protocols) & Tier 3 (supporting research) studies. Assessment protocols will be designed to address national needs for information about isolated wetlands and state and tribal wetland management priorities.**



**National Priorities for Monitoring and Assessment of Isolated Wetlands**

- Where are these wetlands located in the landscape?
- How do we prioritize for protection and restoration?
- How do we evaluate their condition?
- What is the functional and habitat significance of these wetlands?

**3-Tiered Approach to the Assessment of New England Seasonally-Flooded Ponds**

- Landscape-scale assessment
- Rapid assessment protocols
- Supporting research

**State and Tribal Wetland Management Priorities**

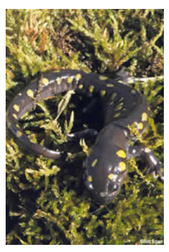
- Prioritize wetlands for open space acquisition
- Baseline monitoring for impacts resulting from urbanization and human disturbance
- Monitor and assess impacts to wetlands resulting from loss of buffer zones

### Tier 2. Rapid Assessment Protocols

The intent of the rapid assessment protocol is to provide sound, quantitative information on the condition of seasonally-flooded ponds with a relatively small investment of time and effort. The assessment protocol will include descriptions of land use in adjacent upland buffers, stressor and disturbance identification, on-site plant cover, soil characteristics, and hydrology. Management applications of Tier-2 rapid assessments may include stressor and disturbance identification at individual sites, CWA Section 305(b) reporting of ambient wetland conditions, functions and values estimation for permitting, and refined site identification (opportunity) for restoration or compensatory mitigation efforts.

**Subset of proposed metrics for a rapid assessment protocol for southern New England seasonally-flooded ponds.**

| Indicator | Group | Type | Reference |
|---|---|---|---|
| 1) Plant species in pond | Hydroperiod | Characterization | Mitchell, 2005<br>Skidds and Golet 2005 |
| 2) Open basin depth | Hydroperiod | Characterization | Skidds and Golet 2005 |
| 3) Landscape setting | Landuse/Alteration | Characterization | Colburn 2004, Table 4-5 |
| 4) Presence / width of terrestrial corridor to adjoining woodlands | Landuse/Alteration | Disturbance | Gibbons 2003 |
| 5) Within-pond vegetation structure | Plants | Characterization | Calhoun et al. 2003 |



### Tier 3. Supporting Research: Intensive Site Assessments

Tier 3 consists of supporting research and intensive site assessments to help develop and validate rapid assessment metrics. Tier 3 studies may also help in defining management and conservation strategies: for example, recent studies have demonstrated that protecting a diversity of ponds with varying hydro periods may be an effective strategy to maintain the long-term stability of amphibian populations (Paton and Crouch 2002).

**Cumulative percentiles of timing of amphibian adult immigration to ponds, metamorph emigration from ponds, and two estimates of duration in breeding ponds in southern Rhode Island (excerpted from Paton and Crouch 2002).**

| | *Adult immigration* | | | *Metamorph emigration* | | | *Days in Pond* | |
|---|---|---|---|---|---|---|---|---|
| *Species* | *5%* | *50%* | *95%* | *5%* | *50%* | *95%* | *min*[a] | *max*[b] |
| Gray tree frog | 1 May | 27 May | 28 Jun | 15 Jul | 1 Aug | 3 Sep | 66 | 125 |
| Wood frog | 26 Feb | 9 Mar | 4 Apr | 18 Jun | 29 Jun | 20 Jul | 112 | 144 |
| Spotted salamander | 1 Mar | 16 Mar | 8 Apr | 21 Jul | 18 Aug | 28 Sep | 155 | 211 |
| Marbled salamander | 3 Aug | 26 Aug | 8 Sep | 14 Jun | 27 Jun | 23 Jul | 238 | 264 |

[a]Equals fiftieth percentile for metamorph emigration minus fiftieth percentile for adult immigration.

[b]Equals ninety-fifth percentile for metamorph emigration minus fifth percentile for adult immigration.

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